

## SECURITY TAG ASSEMBLY

### BACKGROUND OF THE INVENTION

#### Claim of Priority

The present application is a continuation-in-part application of previously filed, now pending application having Serial No. 10/207,354, filed on July 29, 2002 incorporated herein by reference.

#### Field of the Invention

This invention relates to an anti-theft security tag assembly which can be operatively attached to various types of merchandise and which includes an indicator assembly providing one or more indications of unauthorized removal of the merchandise from a retail establishment or other area. Shielding is provided to prevent unauthorized removal of the tag assembly from the merchandise.

### DESCRIPTION OF THE RELATED ART

Security or anti-theft tags are extensively used in the retail merchandising industry as well as numerous other areas of commerce. In typical fashion, such devices are attached to various types of merchandise in such a manner that that they are clearly obvious by one examining the merchandise. Common knowledge of the use and operation of such devices is believed to prevent or at least

1 restrict the theft or other unauthorized removal of merchandise  
2 from the retail outlet or other area being monitored. More  
3 specifically, it is believed that such security tag devices serve  
4 as a deterrent to unauthorized removal in that a potential thief  
5 will recognize that the merchandise will be "stained" or otherwise  
6 marked, thereby rendering the merchandise useless, upon forced  
7 removal of the security tag. Alternatively the tag may be  
8 structured to activate an alarm system as the merchandise,  
9 incorporating the tag thereon, passes through a monitoring station  
10 typically located at the exits to the retail establishment.

11 Due to the popularity of security or anti-theft devices of the  
12 type described above, numerous attempts have been made to design  
13 and structure a device which not only serves as a deterrent against  
14 theft, but which includes structural features intended to overcome  
15 any attempt to defeat the device which may be applied by an  
16 experienced thief. In addition, the structure of such security  
17 devices should be such as to be easily secured to and removed from  
18 different types of articles such that a device of substantially  
19 standard structure can be used to monitor and protect various types  
20 of merchandise.

21 As set forth above known security or anti-theft tags are  
22 intended to provide some indication which either renders the  
23 merchandise useless or alternatively signals an attempted  
24 unauthorized removal. As such, at least one type of indicator is  
25 structured to release an ink or colored staining agent upon a

1 forced removal of the security device from the merchandise, such as  
2 by rupturing the outer casing or other portions thereof. The  
3 released staining agent is difficult, if not impossible, to remove  
4 from the protected merchandise thereby clearly indicating that the  
5 stained article has been stolen. In addition, such anti-theft  
6 devices may include some type of electronic signaling mechanism.  
7 This type of device activates an alarm by passing through or in  
8 predetermined proximity to a monitoring station, as set forth  
9 above. However, because of the large number of practical  
10 applications for such security devices, the various users thereof  
11 may request one or the other of the aforementioned types of  
12 indicators (ink stain or electronic signaling). Also, a retailer  
13 may in fact desire more than one type of indicator or different  
14 types of "customized" indicator or signaling devices which better  
15 protect against the unauthorized removal of merchandise from a  
16 given area.

17 While popular, it is recognized that a significant number of  
18 the anti-theft tags currently being utilized include problems or  
19 disadvantages which render them less than totally efficient. More  
20 specifically, wide spread knowledge of the structural features of  
21 such security tags allows unauthorized personnel to develop  
22 techniques which are specifically designed to remove the tag from  
23 the merchandise in a manner which defeats the aforementioned  
24 indicator structures. Therefore it is not uncommon for a skilled  
25 or experienced thief to develop tools or techniques to remove the

1 merchandise from the area being monitored without damage to the  
2 stolen article or activation of an alarm or monitoring system.

3 Accordingly there is a recognized need in the security  
4 industry for an anti-theft device preferably in the form of a  
5 relatively small security tag assembly which efficiently locks onto  
6 various types of merchandise and which is specifically structured  
7 to overcome known techniques used to remove or otherwise defeat  
8 such devices. By way example, one method commonly employed by a  
9 potential thief is to apply heat or a small flame, of the type  
10 generated by a cigarette lighter, to predetermined portions of the  
11 tag housing. In doing so the housing may be accessed for purposes  
12 of removing operative components thereof which serve to maintain  
13 the device in locking engagement on the merchandise, without  
14 releasing the staining agent or otherwise activating monitoring  
15 alarms.

16 Therefore, an improved or preferred security tag assembly  
17 should include specific structural features which overcome attempts  
18 to defeat the device, such as, but not limited to, the method set  
19 forth above. Moreover, such protective structural features should  
20 be compatible with standardized tag construction and  
21 configurations. This would enable the tag manufacture or provider  
22 to effectively "customize" the indicator assembly to include  
23 staining agents, electronic signaling devices or both, while not  
24 requiring a restructuring or redesign of the entire tag or the  
25 remaining, basic operable components associated therewith.

1     SUMMARY OF THE INVENTION

2           The present invention is directed to a security tag assembly,  
3     also commonly known as an anti-theft tag, structured to be  
4     connected in an operative position to various types of merchandise.  
5     The aforementioned operative position of the device is more  
6     specifically described as a housing thereof being mounted, secured,  
7     etc. on or to the merchandise in a substantially obvious location  
8     so as to inform the potential buyer that the particular merchandise  
9     is being protected against unauthorized removal.

10          Accordingly, the security tag assembly of the present  
11     invention comprises a housing having at least two separable  
12     portions defining the exterior of the tag. A plurality of operable  
13     components are located within the housing between and in some cases  
14     connected to a specific one of the separable housing portions.  
15     Moreover, one of the separable portions includes a connector member  
16     fixedly secured thereto and structured to removably engage the  
17     merchandise being protected. In at least one preferred embodiment  
18     the connecting member may be in the form of an elongated pin  
19     structured to penetrate the merchandise with no discernable damage  
20     being done thereto.

21          Further, a locking assembly is mounted within the housing in  
22     receiving relation to the connector member. When the connector  
23     member is engaged by the locking assembly it is maintained in the  
24     aforementioned operative position, wherein the housing is "locked"  
25     onto the merchandise. The locking assembly is structured to be

1 selectively positioned between its locking engagement with the  
2 connector member and a position which releases the locking member.  
3 In the latter position of the locking assembly, the separable  
4 portions of the housing may then be separated and the merchandise  
5 can be disconnected from the housing without damage, such as when  
6 the merchandise is properly purchased and the removal of the  
7 security tag assembly is authorized.

8 As will be described in greater detail hereinafter, the  
9 locking assembly may be of the type structured to be selectively  
10 unlocked from the connector member when it is exposed to an  
11 externally applied force, such as a magnetic force. The magnetic  
12 force is applied from an exterior of the housing by authorized  
13 personnel, using equipment provided by the retail establishment.  
14 It is of course contemplated that the locking assembly may assume  
15 a variety of other structures which are specifically operative to  
16 maintain the housing in an operative position, secured to the  
17 merchandise, or be selectively disconnected therefrom.

18 In the manufacture and use of security tag assemblies or anti-  
19 theft tags it is common knowledge that unauthorized personnel  
20 attempt to defeat the security tags and remove them from the  
21 merchandise being protected by a variety of known techniques. One  
22 such technique includes the application of heat and/or flame to a  
23 predetermined exterior portion of the housing in attempt to  
24 disable, reorient and/or remove the locking assembly from its  
25 locked engagement with the connector member. Therefore, one

1 structural an operative feature of the present invention is the  
2 inclusion of a shield assembly mounted within the housing and  
3 disposed and structured to protect the locking assembly from being  
4 accessed through the application of heat or flame.

5 Accordingly, the shield assembly of the present invention  
6 comprises what may be considered a "cup-like" structure having a  
7 hollow interior an access opening formed generally at one end  
8 thereof. Both the access opening and the hollow interior are  
9 dimensioned and configured to receive at least a majority of the  
10 locking assembly therein. As such, the shield assembly  
11 substantially surrounds or at least partially encloses a  
12 significant portion of the locking assembly. Further, the shield  
13 assembly is formed from a metallic or other heat resistant material  
14 in order to resist the external application of heat, flame, etc. to  
15 the housing in order to accomplish authorized access to the locking  
16 assembly and/or manipulation thereof.

17 Another structural feature of the present invention is the  
18 generally standardized structuring of the housing, as well as the  
19 remaining operable components thereof, in order to accommodate one  
20 or more preselected indicator members. Further, the manufacturer  
21 or provider of the subject tag assembly may easily replace and/or  
22 "customize" the indicator assembly by providing a plurality of  
23 different indicator members or one or more of the same type of  
24 indicator members, without varying the structural configuration of  
25 the remainder of the device. As is well recognized in the security

1 tag industry, such indicator members may be in the form of ink or  
2 staining agent capsules or reservoirs which serve to stain the  
3 merchandise upon attempted removal or the housing from the  
4 merchandise. Alternatively, one or more of the indicator members  
5 may include some type of electronic signaling device specifically  
6 structured to activate one or more alarms located at monitoring  
7 stations, typically positioned at the exit of a retail  
8 establishment or other given area being monitored. It is  
9 emphasized that a variety of other indicator members may be  
10 utilized dependent upon the desires and needs of the consumer  
11 intending to implement such security tag assemblies.

12 These and other objects, features and advantages of the  
13 present invention will become more clear when the drawings as well  
14 as the detailed description are taken into consideration.

#### 15 16 BRIEF DESCRIPTION OF THE DRAWINGS

17 For a fuller understanding of the nature of the present  
18 invention, reference should be had to the following detailed  
19 description taken in connection with the accompanying drawings in  
20 which:

21 Figure 1 is a perspective view of the housing of the security  
22 tag assembly of the present invention.

23 Figure 2 is a front plan view of one of the separable portions  
24 of the housing of the embodiment of Figure 1 with a connector  
25 member secured thereto.



1           Figure 3 is a front plan view of the other of two separable  
2 portions of the housing of the embodiment of Figure 1 with an  
3 interior housing section secured thereto.

4           Figure 4 is a perspective view of the embodiment of Figure 2.

5           Figure 5 is a top perspective view of the embodiment of Figure  
6 3.

7           Figure 6 is an exploded view of the preferred embodiment of  
8 Figures 1 through 5 disclosing the separable housing portions and  
9 the operable components contained therein.

10          Figure 7 is a front plan view of the connector member of a  
11 preferred embodiment of the present invention.

12          Figure 8 is an exploded view of the separable components of  
13 the housing of the embodiment of Figure 1 including details of an  
14 indicator assembly associated with the interior housing section  
15 disclosed in the embodiments of Figures 3, 5 and 6.

16          Figure 9 is a front plan view of the interior housing section  
17 having an indicator assembly mounted thereon.

18          Figure 9A is a front plan view of another preferred embodiment  
19 of the interior housing section wherein an additional indicator  
20 assembly is represented in phantom lines.

21          Figure 10 is a retainer portion associated with the indicator  
22 assembly of at least one preferred embodiment of the security tag  
23 assembly of the present invention.

24          Like reference numerals refer to like parts throughout the  
25 several views of the drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in the accompanying Figures, the present invention is directed to a security tag assembly generally indicated as 10 and including a housing generally indicated as 12. The housing includes a plurality of separable portions 14 and 16 structured to be lockingly but removably secured to one another, such as when in an operative position. The operative position is further defined by any of a plurality of different types of merchandise being secured between the separable housing portions 14 and 16 so as to extend outwardly from a commonly disposed peripheral seam 18. The merchandise (not shown for purposes of clarity) is therefore clamped between the separable portions 14 and 16 and is maintained in such a clamped position by a connector member 20 dimensioned and configured to penetrate and pass through the merchandise.

Further, as best shown in Figures 1 through 5 the separable housing portions 14 and 16 are have substantially equivalent dimensions and configurations, so as to facilitate the formation of an extremely close fitting, tight seal about the peripheral seam 18. As such, there is virtually no spacing along the length of the peripheral seam 18 which would allow unauthorized personnel to pass a tool or instrument there between in an effort to separate the housing portions 14 and 16. Also, as described in greater detail hereinafter, an interior housing section 17 is provided to house and retain the various operative components of the tag assembly 10. Moreover, the interior housing section 17 is also cooperatively

1 structured with the separable housing portions 14 and 16 by having  
2 a substantially convex exterior surface configuration, as shown in  
3 Figure 3. Such a convex configuration further prohibits or  
4 significantly restricts the passage of an instrument or tool beyond  
5 the peripheral seam 18. Any such attempts would result in the  
6 penetrating end of such an instrument to immediately abut against  
7 the convex exterior surface of the housing section 17 as it rises  
8 or extends upwardly or outwardly beyond the peripheral seam 18.

9 With primary reference to Figures 6 and 7, a preferred  
10 embodiment of the connector member 20 may be more specifically  
11 defined by an elongated pin or like structure formed of stainless  
12 steel or other hard, durable material. Further, the connector pin  
13 includes an enlarged head 22 embedded or otherwise fixedly and/or  
14 permanently secured within an interior end portion 24 of one of the  
15 separable portions, as at 14. The outer or distal end 26 of the  
16 connector member may or may not be sharpened or pointed and is  
17 disposed and structured to penetrate the merchandise. When so  
18 engaged by the connector member 20, the merchandise is maintained  
19 in the aforementioned operative position, clamped between the  
20 lockingly secured by separable portions 14 and 16.

21 The enlarged, outwardly extended or expanded configuration of  
22 the head 22 is such as to make it extremely difficult if not  
23 impossible to pass through the merchandise which has been  
24 penetrated by the shaft 23 of the connector pin 20. Accordingly,  
25 in the unlikely event that an unauthorized person were able to

1 break through the outer surface of the housing portion 14 and some  
2 how dislodge the connector 20 therefrom, it would be impossible or  
3 extremely difficult to accomplish passage of the enlarged head 22  
4 through the merchandise being penetrated by the relatively thin  
5 shaft 23. As set forth hereinafter, the shaft 23 will be lockingly  
6 engaged or gripped by the locking assembly generally indicated as  
7 30. Therefore, in order to remove the merchandise from the  
8 connector 20, an unauthorized person would have to force the  
9 enlarged head 22 through the merchandise causing significant damage  
10 and thereby rendering the merchandise useless.

11 Other structural components of the security tag assembly 10 of  
12 the present invention include an interior housing section 17  
13 mounted on within the housing 12 as shown in Figures 3, 5 and 6.  
14 The interior housing section 17 is cooperatively disposed,  
15 configured and structured with one of the separable portions, such  
16 as at 16, to movably and operably contain a locking assembly  
17 generally indicated as 30. The locking assembly 30 is movably  
18 mounted within a first sleeve portion 32 secured to the interior  
19 housing section 17. Similarly, when assembled, the various  
20 components of the locking assembly 30 are cooperatively and movably  
21 positioned relative to one another within a second sleeve structure  
22 34 secured to the separable housing portion 16. Both the sleeve 32  
23 and the sleeve 34 comprise hollow interiors and at least one open  
24 end 33 and 35 respectively. In addition, the interior housing  
25 section 17 includes a central bore or opening 19 disposed to

1 receive the passage of the connector member 20 therethrough as it  
2 is disposed in locking but removable engagement with the locking  
3 engagement 30.

4 In at least one preferred embodiment of the present invention,  
5 the locking assembly 30 includes a locking member 36 having a  
6 plurality of balls, rollers or like movable members 38 embedded  
7 therein and movable inwardly into the interior of the locking  
8 member 36. The balls 37 are positioned into frictional, retaining  
9 engagement with a portion of the connector member 20 passing  
10 through the interior of locking member 36. The locking member 36  
11 includes a substantially conical configuration as shown in Figure  
12 6. Similarly, a locking retainer as at 38 also includes a somewhat  
13 conical configuration as well as having a substantially larger  
14 dimension than the locking member 36. The locking member 36 is  
15 received within the locking retainer and due to the cooperative,  
16 conical configurations thereof, the plurality of balls 37 are  
17 forced inwardly, while remaining substantially coplanar with one  
18 another, into the interior of the locking member 36 and into  
19 frictional, locking engagement with the shaft 23 of the connector  
20 member 20. It is emphasized that the mounting of the balls 37 on  
21 the locking member 36 is such as to maintain them in a common plane  
22 or at a common height relative to the longitudinal dimension of the  
23 locking member 36. Therefore, as the balls are allowed to move, at  
24 least partially, into and outwardly from the interior of the  
25 locking member 36 all of the plurality of balls 37 are maintained

1 in a common plane. This assures a maximum gripping or locking  
2 engagement with the shaft 23 of the connector member 20, since the  
3 balls 37 are substantially opposing one another in the  
4 aforementioned common plane, as they concurrently engage the shaft  
5 23 at a common location thereon.

6 Also, because of the cooperative conical configuration of both  
7 the locking member 36 and the retainer member 38, the balls or like  
8 members 37 are maintained in locking engagement with the connector  
9 member 20, until the locking member 36 is forced at least partially  
10 outward from the interior of the retaining member. Therefore, the  
11 locking assembly 30 also includes a biasing spring as at 40 which,  
12 when normally positioned in its operative orientation, serves to  
13 bias locking member 36 upwardly into the interior of the retaining  
14 member 38. As set forth above, the balls or like members 37 are  
15 thereby normally maintained in an inwardly directed orientation  
16 which serves to lockingly engage the connector member 20, in the  
17 operative position, when it passes through the locking retainer 38  
18 and into the interior of the locking member 36.

19 Although not clearly shown, it should be noted that both the  
20 locking member 36 and the locking retainer 38 include through bores  
21 or openings in the respective, substantially closed ends thereof.  
22 These bores are aligned with the bore 19 in the interior housing  
23 section 17 so as to allow the connector member 20 to pass into and  
24 out of locked engagement with the locking assembly 30.

25 Another features of a preferred embodiment of the present

1 invention comprises a shield assembly generally indicated as 42.  
2 The shield assembly 42 is formed of a heat and/or flame resistant  
3 material such as a metallic material. Further, the shield assembly  
4 42 includes what may be considered a "cup-like" configuration  
5 comprising a hollow interior and at least one open end 44.  
6 Further, an outwardly extending peripheral rim 46 surrounds the  
7 open end 44. The shield assembly 42 is disposed within the  
8 interior of the sleeve 34 mounted on or integrally secured to the  
9 separable housing portion 16. Passage of the shield assembly 42  
10 through the open end 35 of the sleeve 34 is readily accomplish to  
11 the extent that the peripheral rim 46 rests on or about the  
12 perimeter of the open end 35 and facilitates a frictional engaging  
13 relation between the shield assembly 42 and the interior of the  
14 sleeve 34.

15 Therefore, in its assembled form the biasing spring 40 is  
16 disposed within the interior of the shield assembly 42 such that  
17 one end thereof bottoms out against the interior surface of the  
18 shield assembly 42. The locking member 36 is biased and maintained  
19 at least partially within the interior of the retaining member 38,  
20 due to the position of the biasing spring 40. The retaining member  
21 38 and locking member 36 are also substantially enclosed or at  
22 least partially surrounded within the interior of the cup-like  
23 shield assembly 42. Accordingly, the open end 46 of the shield  
24 assembly 42 is sufficiently dimensioned to receive the spring 40,  
25 the locking member 36 and the retaining member 38 therein.

1 Similarly, the sleeve 32 substantially surrounds the exterior  
2 surface of the sleeve 34 so as to complete the assembly of the  
3 aforementioned operative components. The sleeve 32 and the sleeve  
4 34 may be permanently bonded such as by ultrasonic welding or other  
5 applicable means. As such, the locking assembly 30 is protected by  
6 the shield assembly 42 on the interior of the housing between  
7 interior surface portions of the interior housing section 17 and  
8 the separable portion 16.

9 As set forth above, the provision of the biasing spring 40  
10 normally directs the rollers or balls 37 inwardly into the interior  
11 of the locking member 36 and into frictional, locking engagement  
12 with the shaft of the connector member 20. However, upon the  
13 application of an external force generally adjacent the exterior as  
14 at 16' of the separable portion 16, the locking assembly 30 may be  
15 moved at least partially outward from the locking retainer 38. The  
16 locking member 36 will then be disposed in an unlocked position so  
17 as to facilitate the removal of the connector member 20 therefrom.  
18 The separable portions 14 and 16 can then be removed from one  
19 another out of the aforementioned operative position.

20 In at least one preferred embodiment of the present invention  
21 the aforementioned external force is supplied in the form of a  
22 magnetic force schematically represented and indicated as 50. The  
23 housing 12, when disposed and locked in its operative position, as  
24 generally shown in Figure 1, can be disposed within the magnetic  
25 field 50 of a magnet assembly generally indicated as 52. Exposure



1 to the magnetic field 50 will serve to move the locking member 36  
2 at last partially outward from the retainer member 38 and towards  
3 and against the biasing force of the biasing spring 40. Once the  
4 locking member is so positioned, the balls 37 are allowed to move  
5 outwardly from the interior of the locking member 36, enabling the  
6 release of the shaft of the connector member 20 therefrom. The  
7 separable portions 14 and 16 may be disconnected and removed out of  
8 the aforementioned operative position.

9 The shield assembly 42 is maintained in protective relation to  
10 the locking assembly 30 by at least partially surrounding at least  
11 a majority thereof. The shield assembly 42 thereby protects the  
12 locking member from external access or manipulation such as when  
13 external heat or flame is applied to an adjacent area 16' of the  
14 housing in the vicinity of the locking assembly 30.

15 With primary reference to Figures 8 through 10, the security  
16 tag assembly 10 of the present invention further comprises an  
17 indicator assembly including at least one but preferably a  
18 plurality of indicator members 53, 54 and 55. These indicator  
19 members are mounted on or within a mounting retainer 56 secured to  
20 an interior or underside of the interior housing section 17 in  
21 engaging and/or retaining relation thereto. The indicator members  
22 53, 54 and 55 may have common structural and operative features or  
23 may differ. By way of example, one or more of the indicator  
24 members 53, 54, and 55 may include an ink or staining agent which  
25 is released such as through openings or apertures 59 formed in an

1 appropriate location on the interior housing section 17.  
2 Alternatively, an undersurface of the retainer 56 as at 56' in  
3 Figure 9 may include openings for the exposure of the one or more  
4 indicator members 53, 54 and 55. Forced and unauthorized  
5 separation of the separable portions 14 and 16 of the housing will  
6 serve to rupture the ink or staining agent capsules thereby  
7 disbursing the ink, etc. onto the merchandise and rendering the  
8 merchandise useless.

9 Another preferred embodiment of the indicator assembly is  
10 depicted in Figure 9A. As shown therein, at least one of a  
11 plurality of indicators may include an indicator member 57  
12 comprising an electronic signaling device. The electronic signaling  
13 device 57 is structured to activate an associated alarm system  
14 located at a monitoring station typically positioned at the exits  
15 of a retail establishment or other area being monitored. The  
16 electronic signaling device 57 may be mounted beneath the surface  
17 56' and substantially within the space between the retainer 56 the  
18 interior housing section 17. Accordingly, the embodiment of Figure  
19 9A comprises the indicator assembly including one or more indicator  
20 members 53 and 54 in the form of staining agent capsules in  
21 combination with the indicator member in the form of the electronic  
22 signaling device 57.

23 Further, the space within the interior housing section 17 is  
24 sufficient to mount a plurality of additional and different types  
25 of signaling devices including, but not limited to, the electronic

1 signaling device 57. It is further emphasized that the tag  
2 assembly 10 of the present invention is structured and dimensioned  
3 to accommodate many different types of indicators including a  
4 variety of different electronic signaling or warning devices. All  
5 of these devices may be mounted within the space between the  
6 retainer 56 and the inner surface of the interior housing section  
7 17, without modifying the dimension, configuration or overall  
8 structure of the housing 12 or the other operative components of  
9 the tag assembly 10.

10 Accordingly, one feature of the present invention is the  
11 ability to standardize the overall structure of the security tag  
12 assembly 10 of the present invention, including the separable  
13 portion 14 and 16 and the interior housing section 17. As such,  
14 various, preselected ones of the indicator members 53, 54 and 55  
15 may be included by the manufacture or provider so as to effectively  
16 "customize" the indicator assembly without requiring a change in  
17 the dimension, configuration or overall structure of the remainder  
18 of the security tag assembly 10. Such "customization" will better  
19 satisfy the needs and desires of the customer and user of the  
20 security tag assembly of the present invention without adding to  
21 the cost of manufacture and assembly of the present invention.

22 Since many modifications, variations and changes in detail can  
23 be made to the described preferred embodiment of the invention, it  
24 is intended that all matters in the foregoing description and shown  
25 in the accompanying drawings be interpreted as illustrative and not

1 in a limiting sense. Thus, the scope of the invention should be  
2 determined by the appended claims and their legal equivalents.

3 Now that the invention has been described,